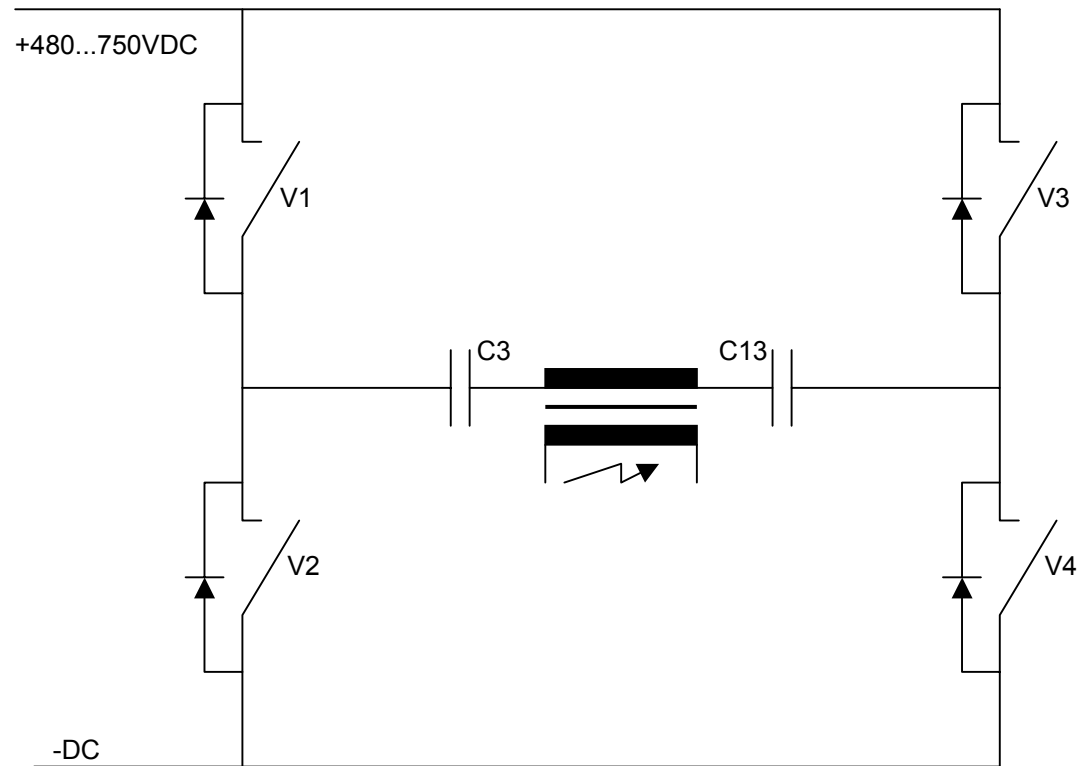# Converter switching principle

Initial condition at standby (no fluoro, no exposure)
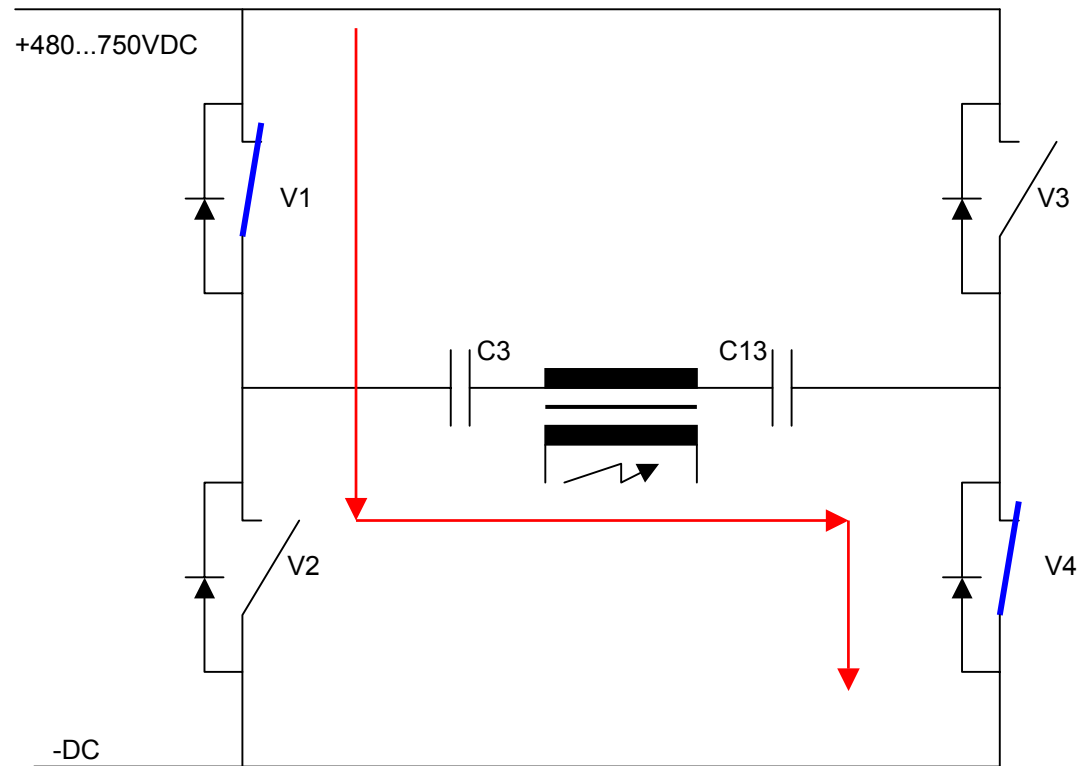
All IGBT's open

step 1:

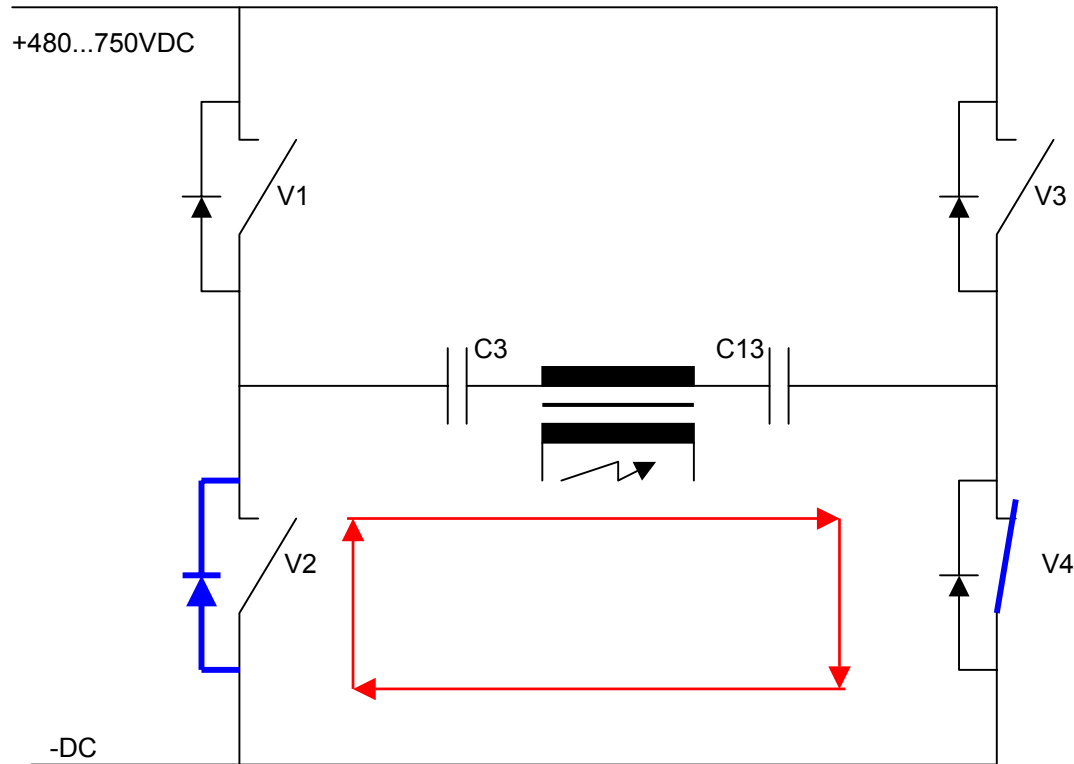IGBT's V1 + V4 now leading
energy into system
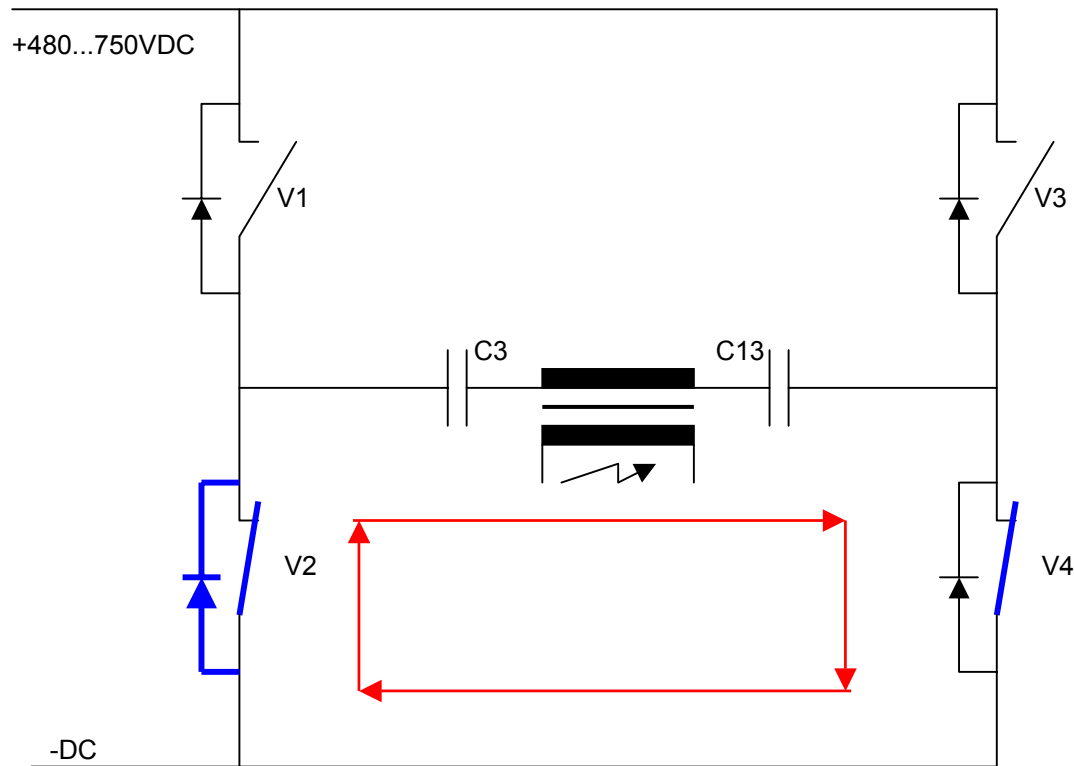primary current from +DC via V1 > C3 > HT coil > C13 > V4 to -DC

step 2:

IGBT V1 opens (load dependent), IGBT V4 kept leading
no more energy into system
primary current keeps flowing through C3 > HT coil > C13 > V4 and parallel diode
of V2

step 3:

IGBT V2 now leading + IGBT V4 kept leading
primary current keeps flowing through C3 > HT coil > C13 > V4 > V2 and parallel
diode of V2
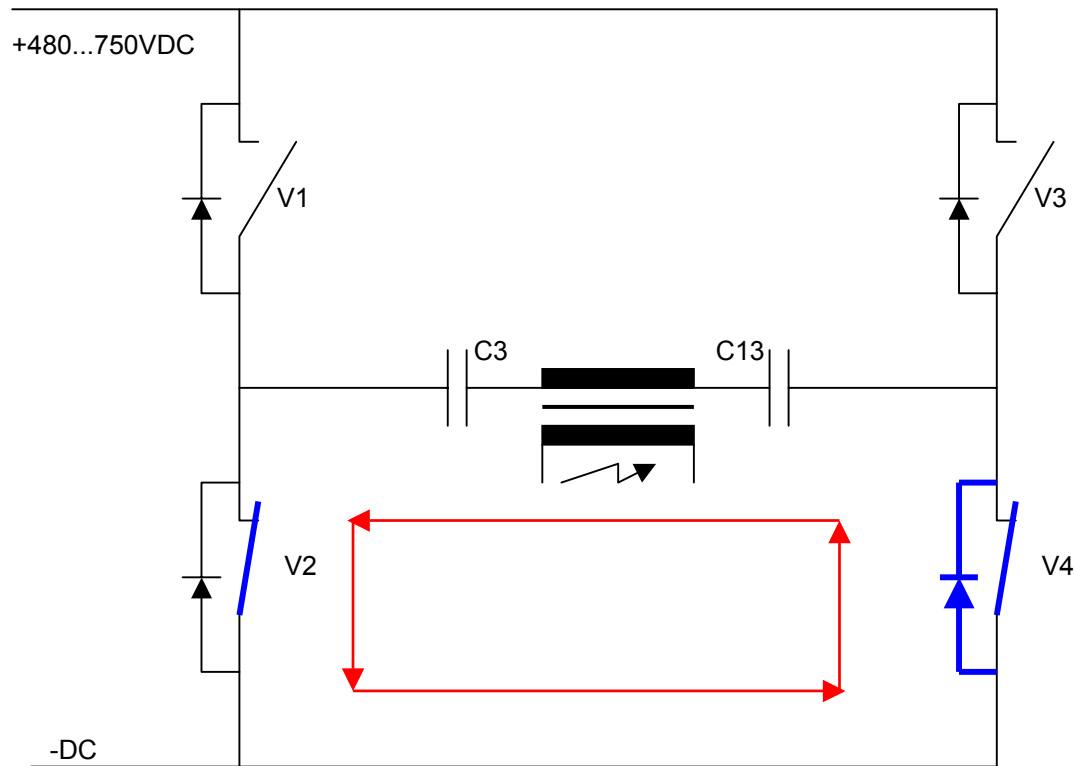
+480...750VDC

V1

V3

C3

C13

V2

V4

-DC

step 4:

IGBT V2 leading + IGBT V4 still kept leading
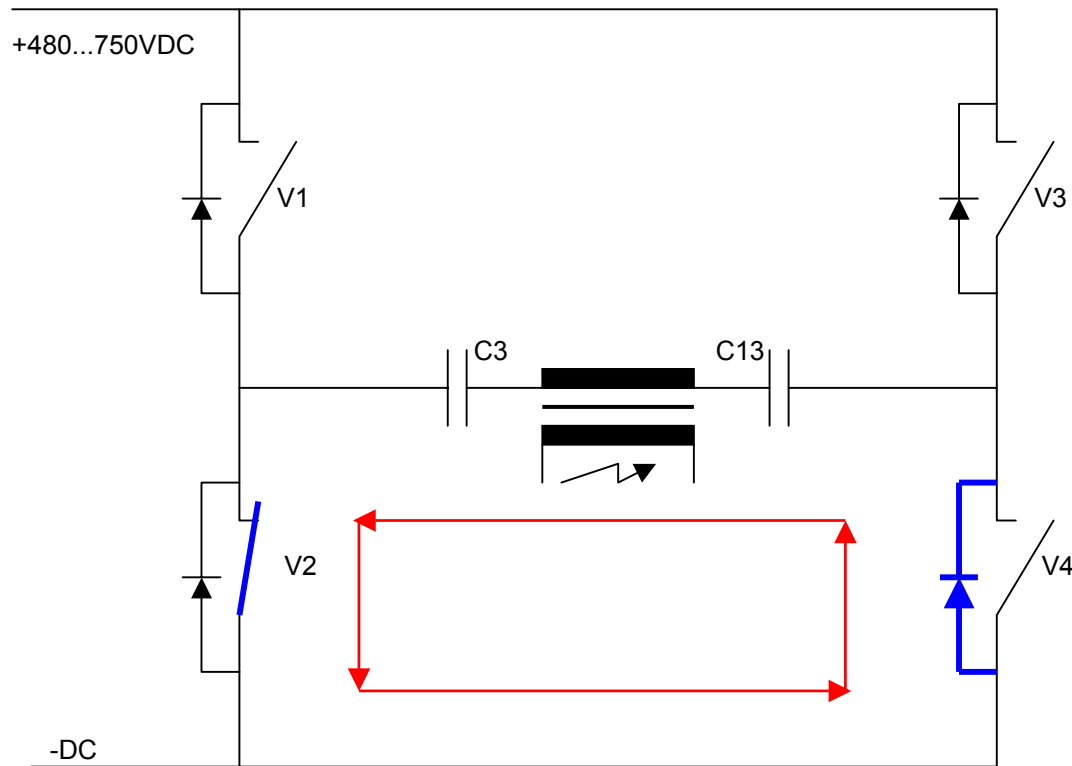primary current changes its direction
primary current flows through C13 > HT coil > C3 > V2 > V4 and parallel diode of V4
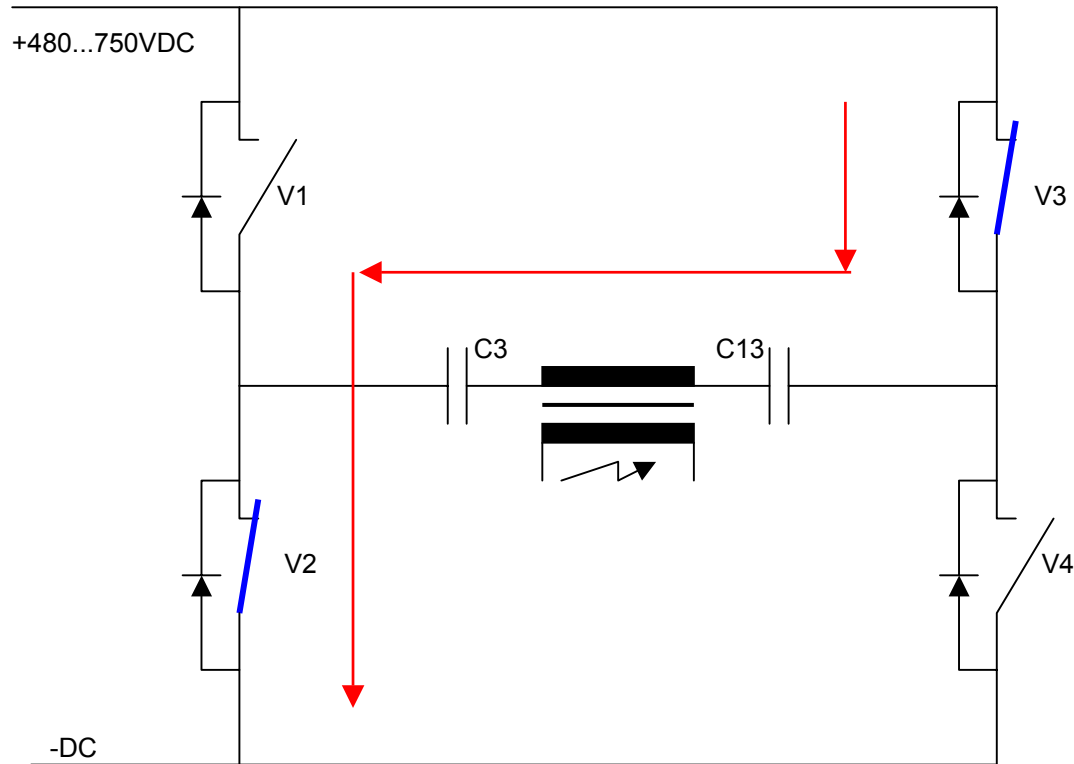
step 5:

IGBT V2 leading + IGBT V4 opens
primary current keeps flowing through C13 > HT coil > C3 > V2 > parallel diode of V4

step 6:

IGBT V2 still leading + IGBT V3 now leading
new energy into system in the reverse direction on top of the flowing primary current
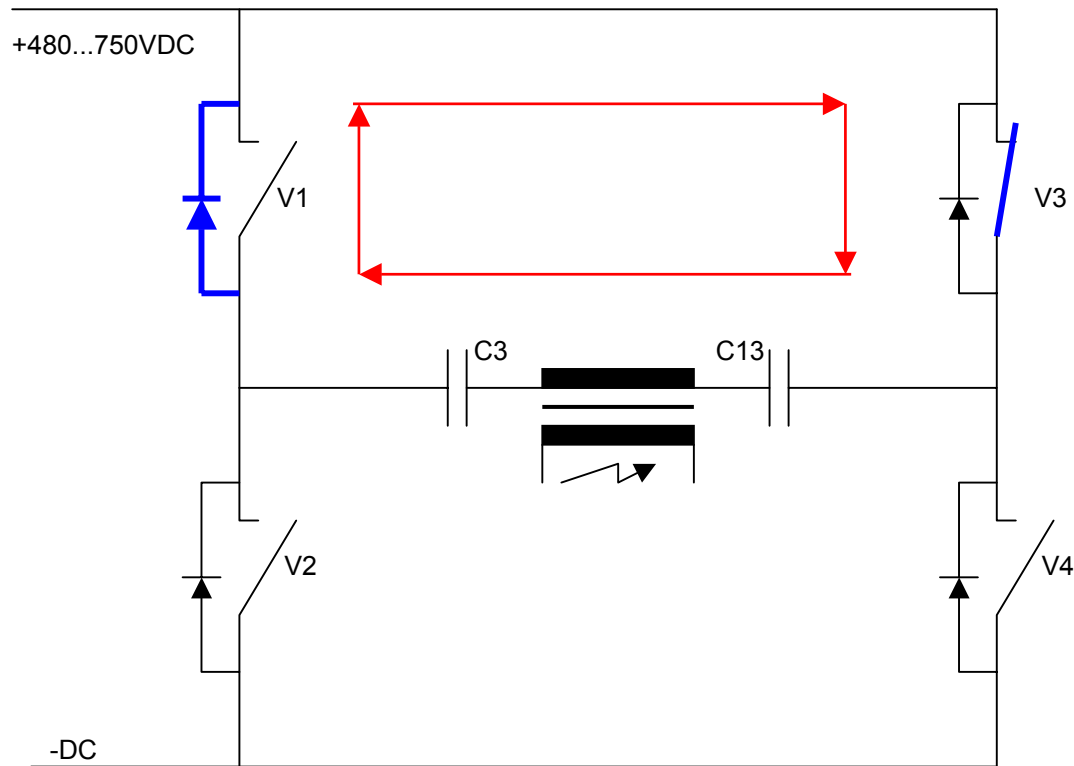from +DC via V3 > C13 > HT coil > C3 > V2 to -DC

step 7:

IGBT V2 opens (load dependent) + IGBT V3 kept leading
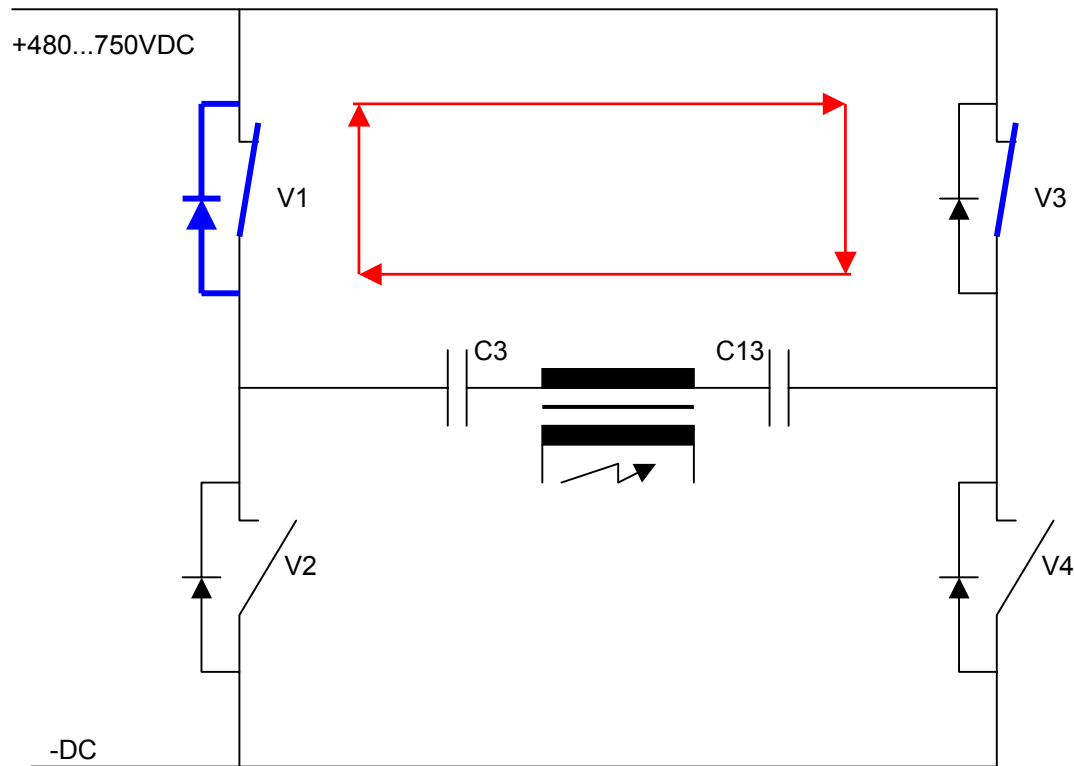no more energy into system
primary current keeps flowing via C13 > HT coil > C3 > parallel diode of V1 > V3

step 8:

IGBT V1 now leading + IGBT V3 leading
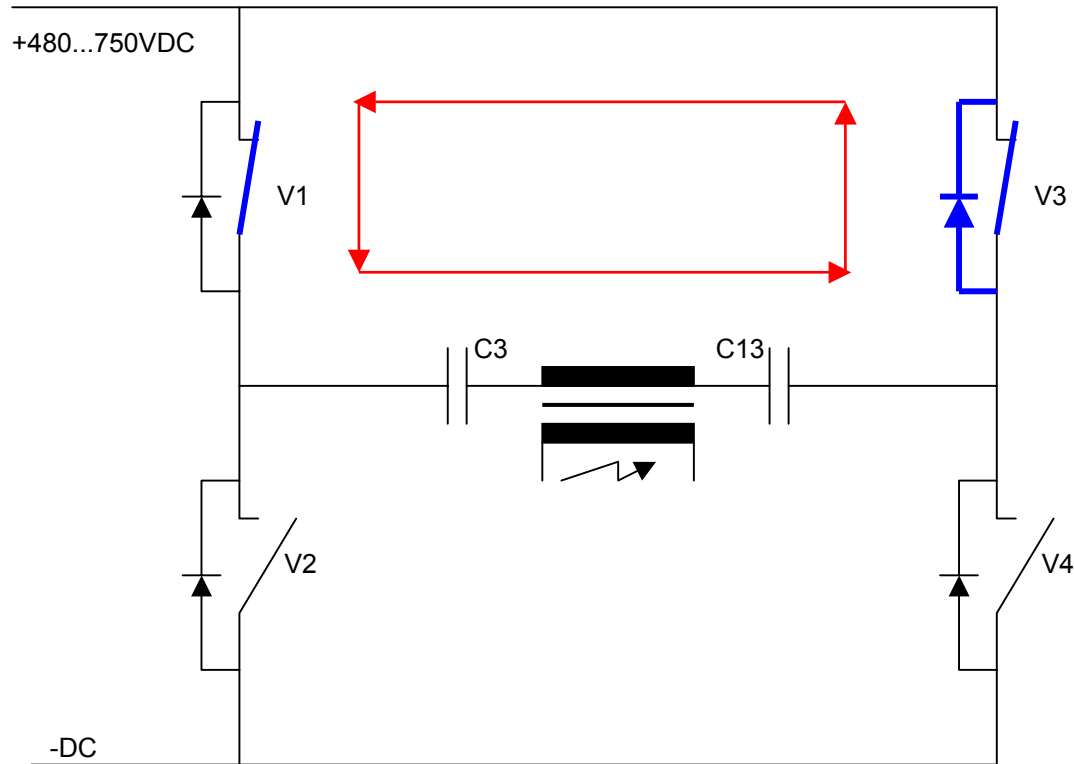primary current keeps flowing via C13 > HT coil > C3 > V1 and parallel diode of V1 > V3

step 9:

IGBT V1 leading + IGBT V3 still leading
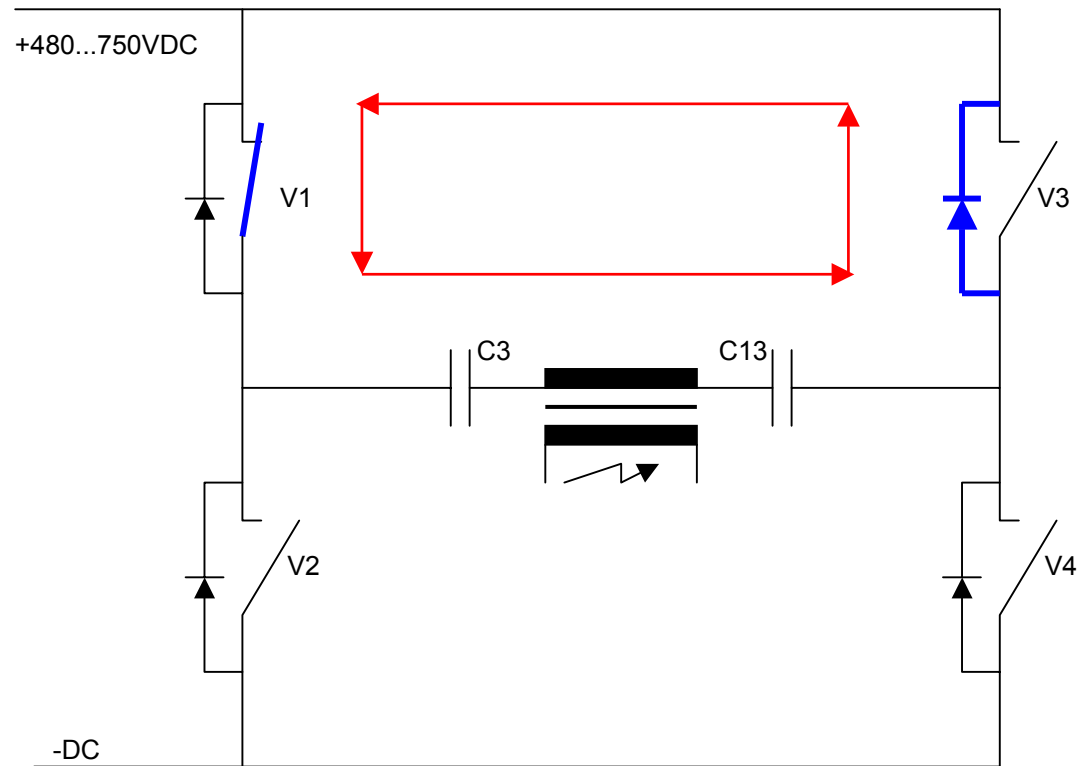primary current changes its direction
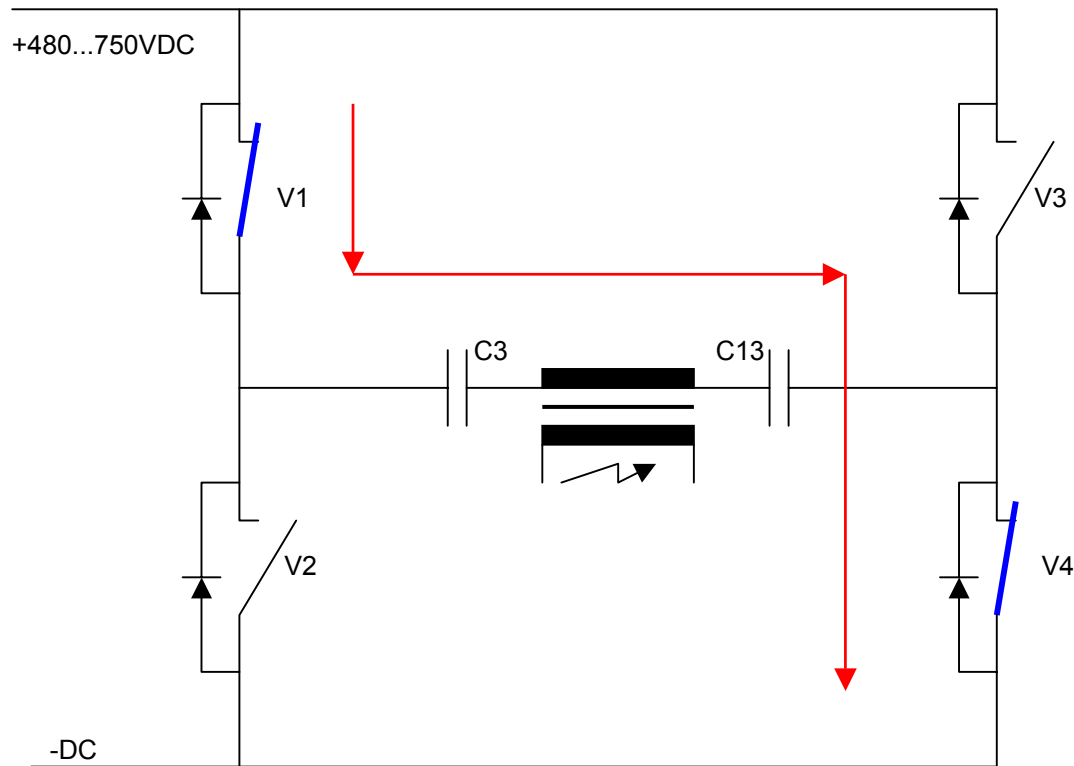primary current via C3 > HT coil > C13 > V3 and parallel diode of V3 > V1

step 10:

IGBT V1 leading + IGBT V3 opens
primary current via C3 > HT coil > C13 > parallel diode of V3 > V1

step 11:

IGBT V1 leading + IGBT V4 now leading
new energy into system in the initial direction on top of the flowing primary current
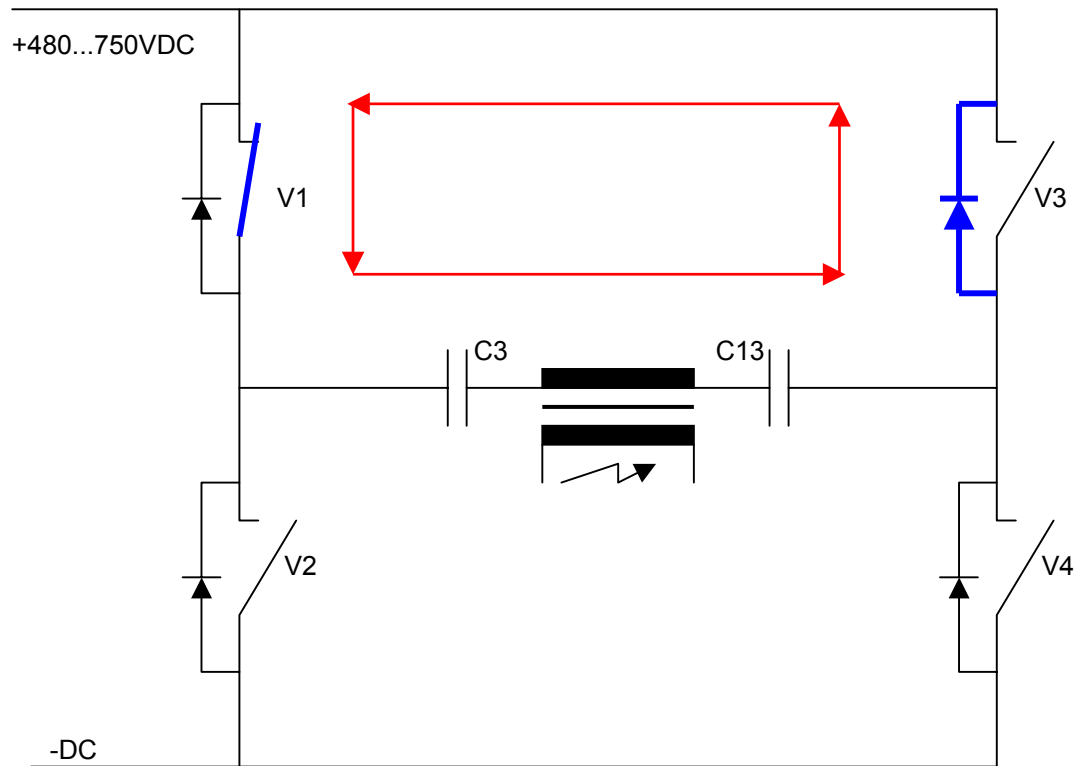from +DC > V1 > C3 > HT coil > C13 > V4 > -DC

step 12:

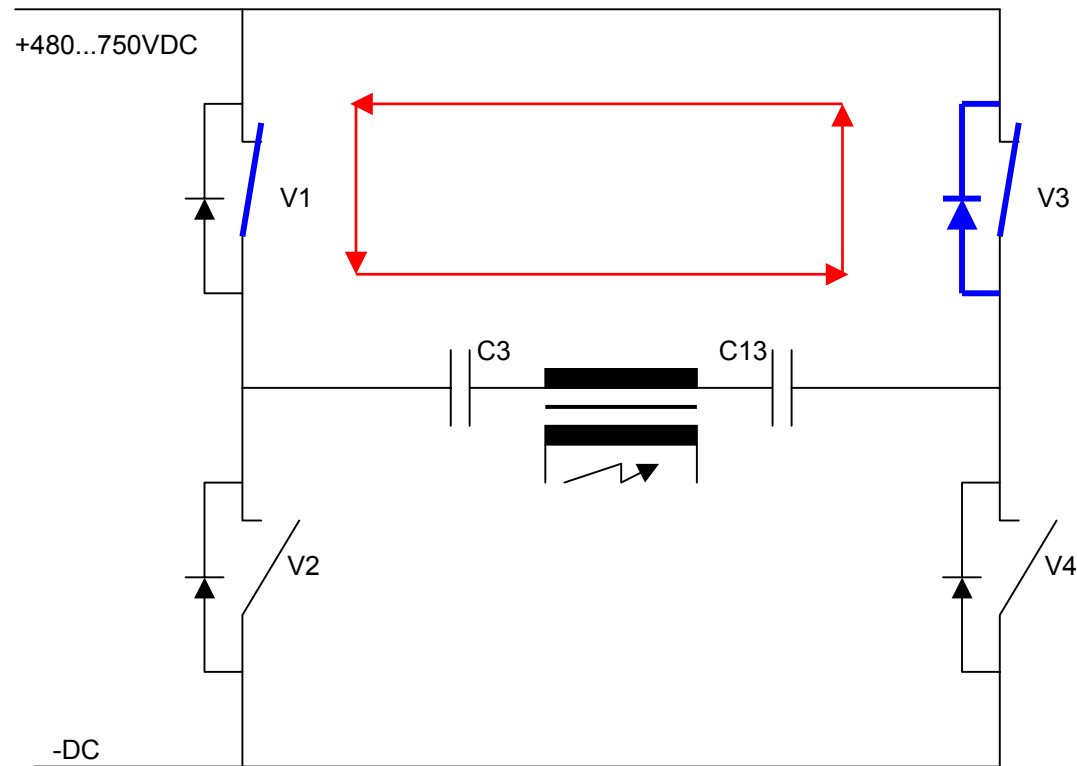IGBT V1 kept leading + IGBT4 opens (load dependent)
no more energy into system
primary current keeps flowing via C3 > HT coil > C13 > parallel diode of V3 > V1

step 13:

IGBT V1 kept leading + IGBT V3 now leading
primary current keeps flowing via C3 > HT coil > C13 > V3 and parallel diode of
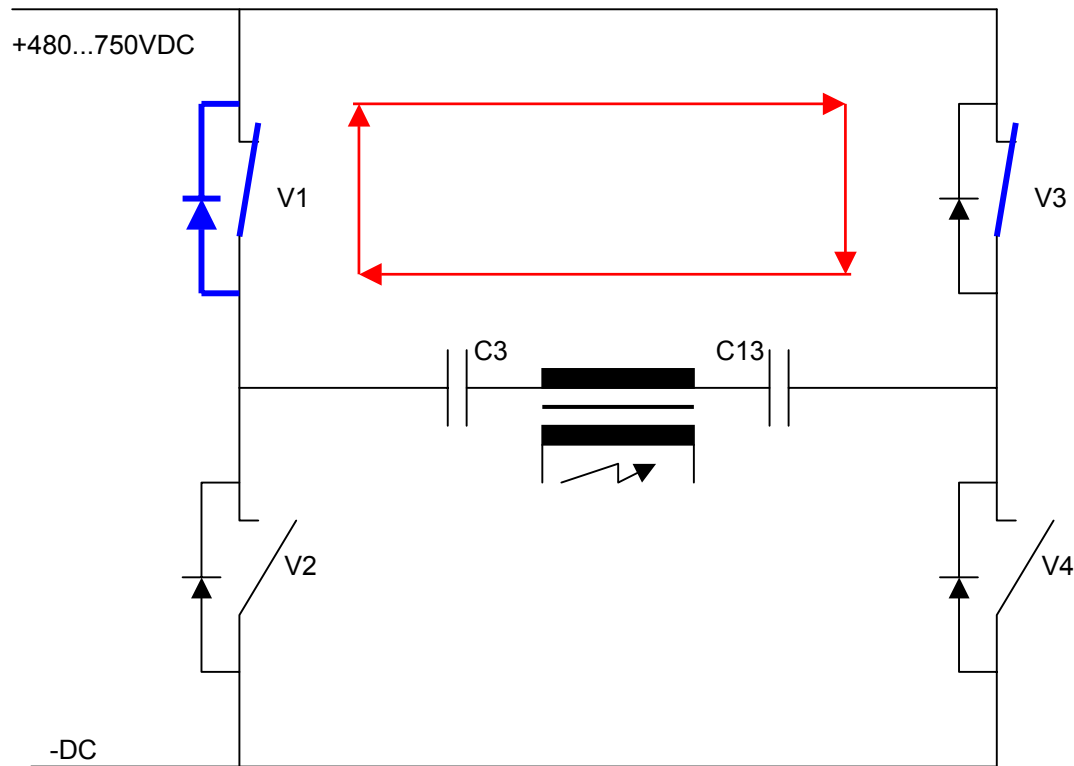V3 > V1

step 14:

IGBT V1 still leading + IGBT V3 leading
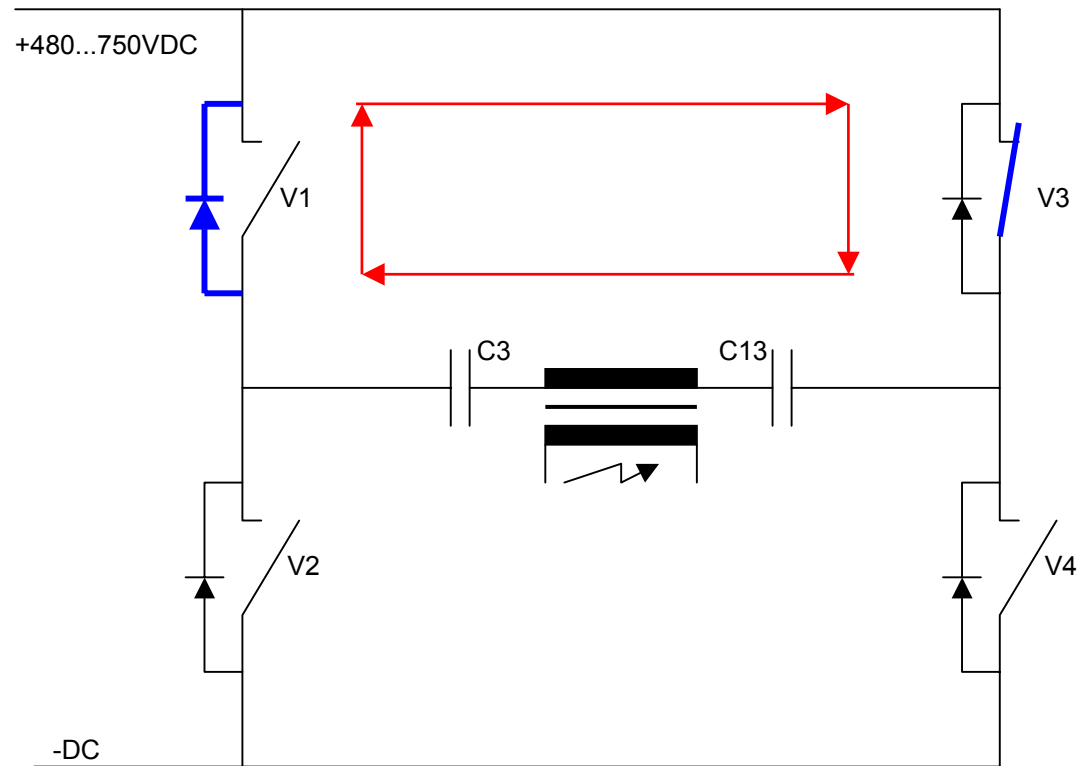primary current changes its direction
primary current via C13 > HT coil > C3 > V1 and parallel diode of V1 > V3

step 15:

IGBT V1 opens + IGBT V3 leading
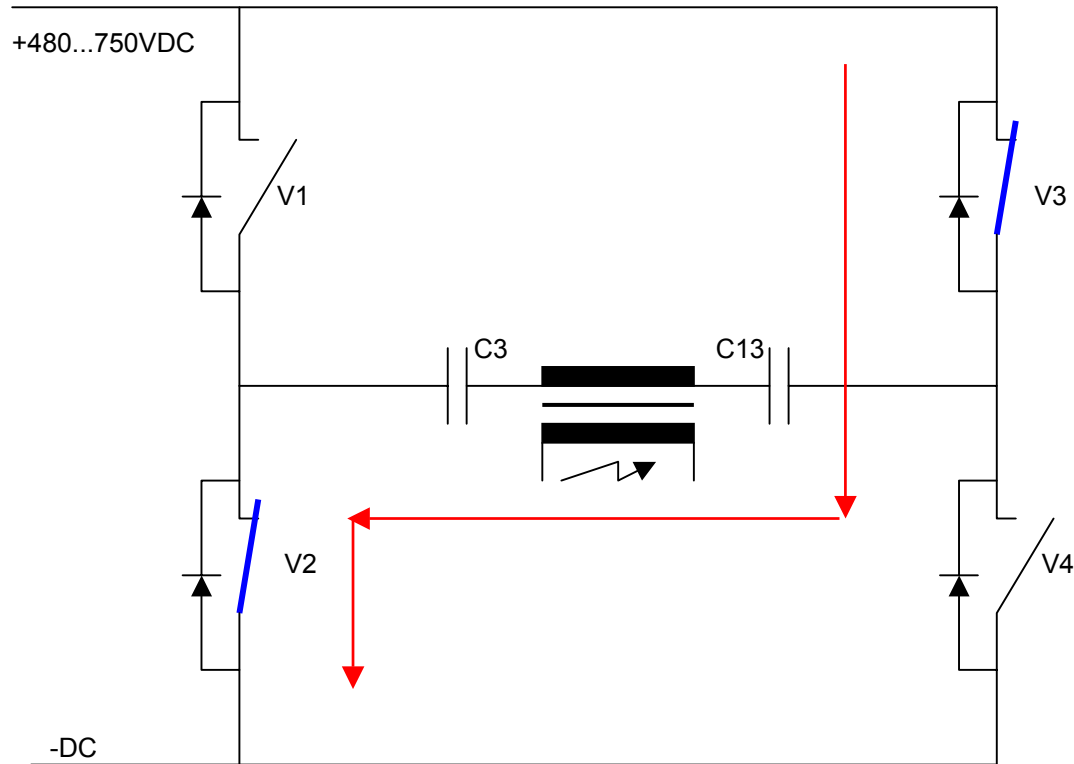primary current via C13 > HT coil > C13 > parallel diode of V1 > V3

step 16:

IGBT V2 now leading + IGBT V3 leading
new energy into system in the reverse direction on top of the flowing primary
current
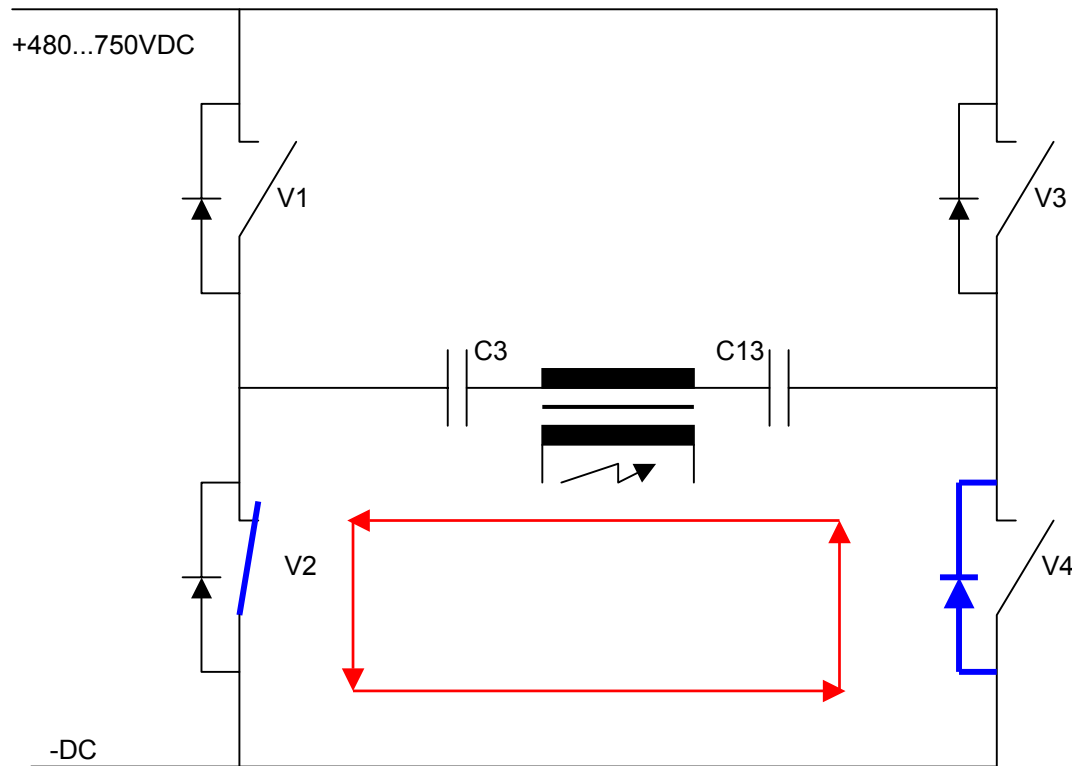from +DC via V3 > C13 > HT coil > C3 > V2 to -DC

step 17:

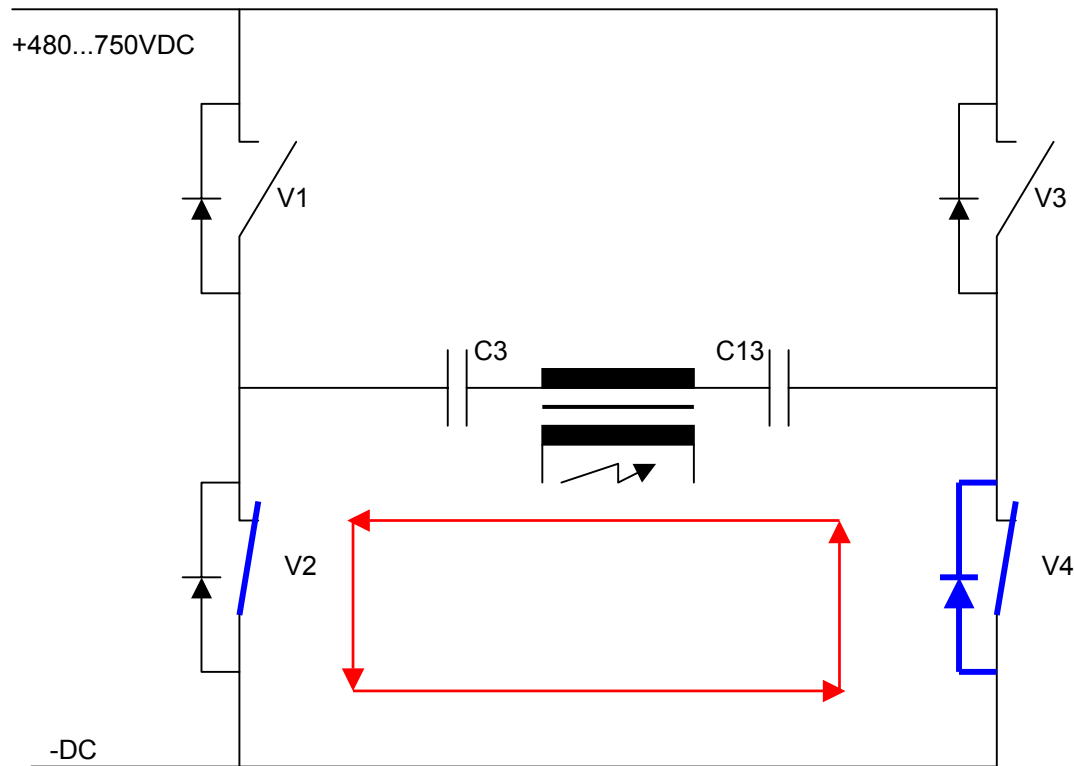IGBT V2 kept leading + IGBT V3 opens (load dependent)
no more energy into system
primary current keeps flowing via C13 > HT coil > C3 > V2 > parallel diode of V4

step 18:

IGBT V2 kept leading + IGBT V4 now leading
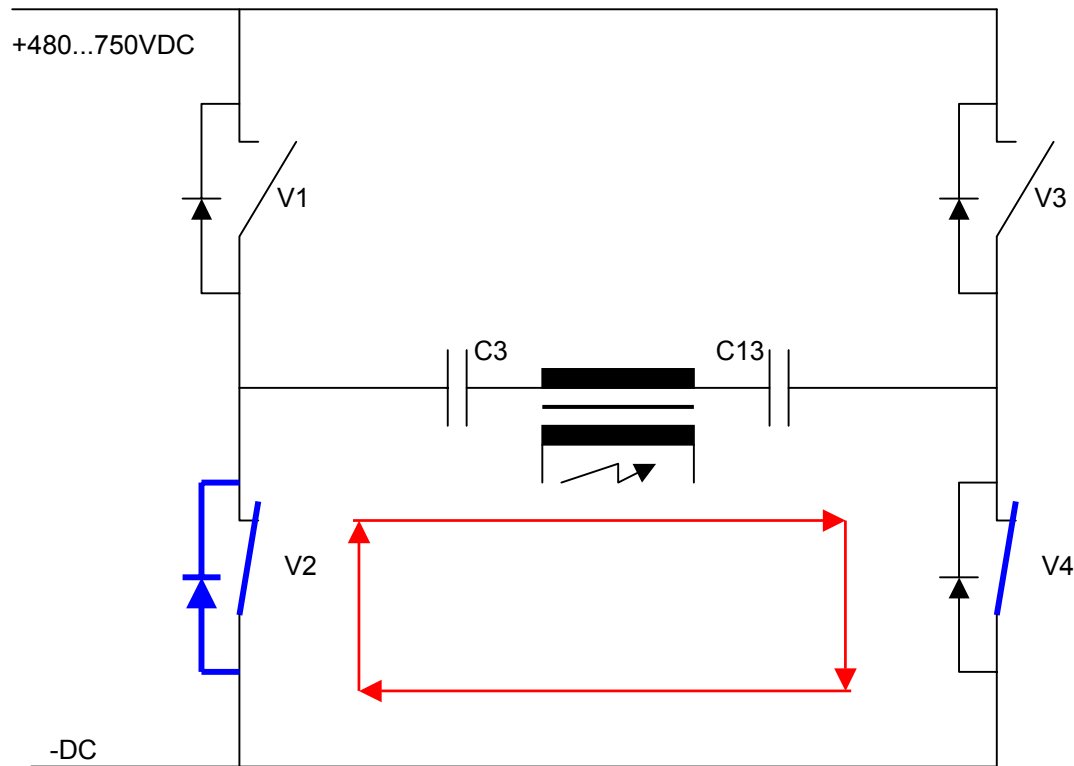primary current via C13 > HT coil > C3 > V2 > V4 and parallel diode of V4

step 19:

IGBT V2 still leading + IGBT V4 leading
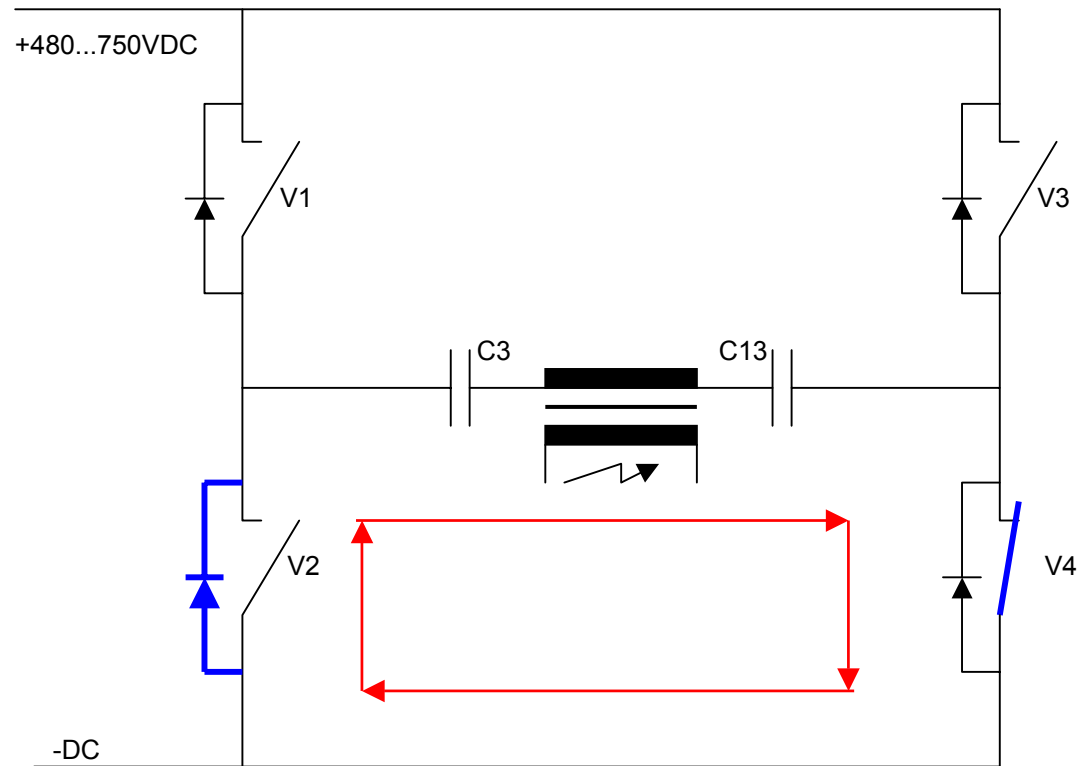primary current changes its direction
primary current via C3 > HT coil > C13 > V4 > V2 and parallel diode of V2

step 20:

IGBT V2 opens + IGBT V4 leading
primary current via C3 > HT coil > C13 > V4 > parallel diode of V2

now go back to step 1